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A Treatise

Paper March 3rd

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Spina Bifida

With two cases of its treatment

By

Isiah Barnes A.M.

Litchfield, Conn.

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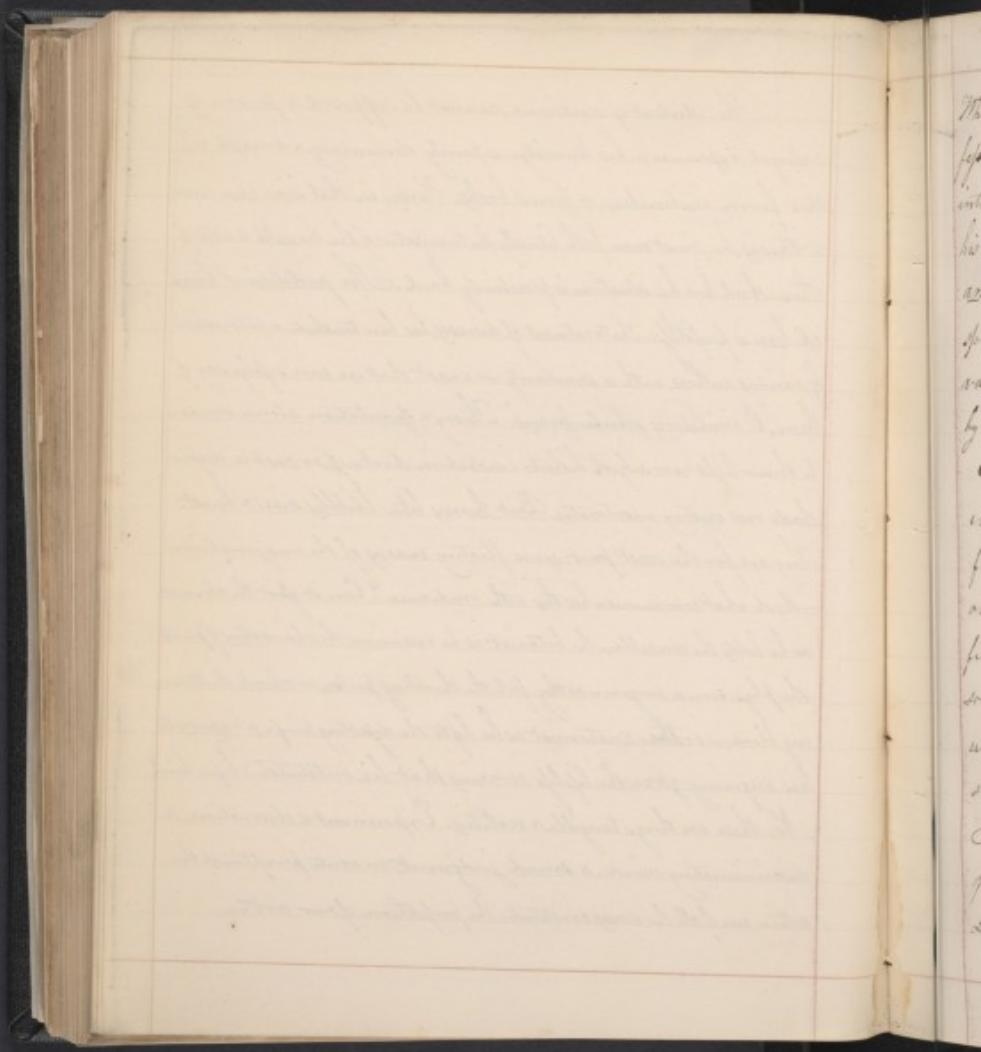
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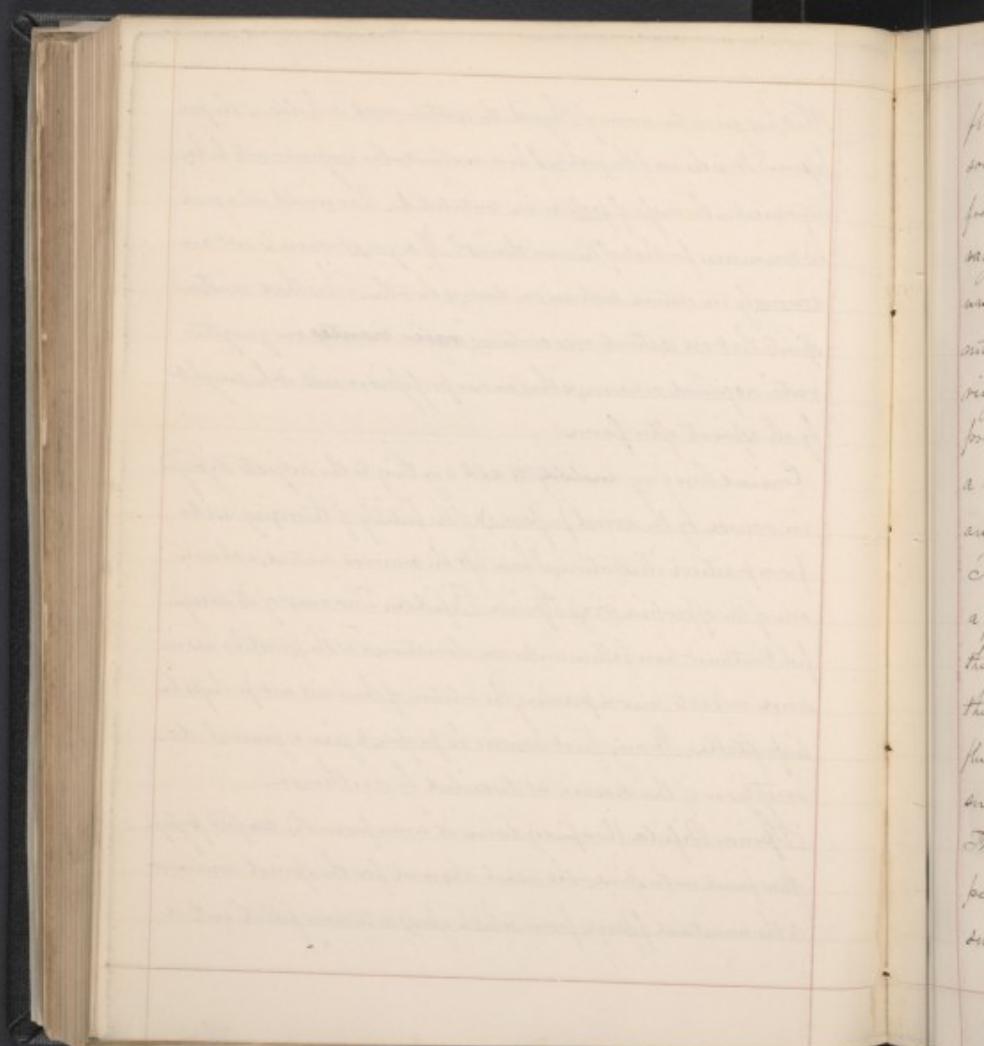
The student of medicine, cannot be supposed a person of enlarged experience; his knowledge is purely elementary & derived either from instruction, or from books. Hence in that sine qua non a thesis, he must come forth literally the troubadour of the thoughts & acts of others. And here his situation is peculiarly hard. The peculation of learning at one is profitless for the treatment of disease, has been touched & retouched by various authors, with a similarity so exact, that we can safely say of them, O imitative scire pueri! Theory & speculation alone remain to throw light upon subjects hitherto involved in darkness, or cast a deeper shade over existing uncertainties. But theories like bubbles rise & burst. They are for the most part mere floating visions of the imagination; — And what communion has they with medicine? Can it profit the chemist as he holds the crucible, — the botanist as he examines the character of plants — the physician a surgeon as they feel the throbbing pulse, or check the streaming blood, — or the anatomist as he lifts the dissecting knife, & exposes to his enquiring gaze the limbs remaining that lie cut-sawed before him? No, these are things tangible & real to us. Experiment & observation, a discriminating mind, a sound judgment, an acute perception, & the entire use of all the senses constitute the perfection of our art.



What has given the name of Physician, the exalted rank it holds in the profession? It is the use of the qualities I have mentioned, ~~the improvements~~ he has introduced - the mass of facts he has constituted. Who would relinquish his eminence for that of the mere theorist? If a great man is not an anomaly in nature such an one deserves the title. Thus those master-spirits that are scattered over creation, ~~varia vantes~~ in juggling waste, acquired renown; & thus in our profession will it be sought by all aspirants after fame.

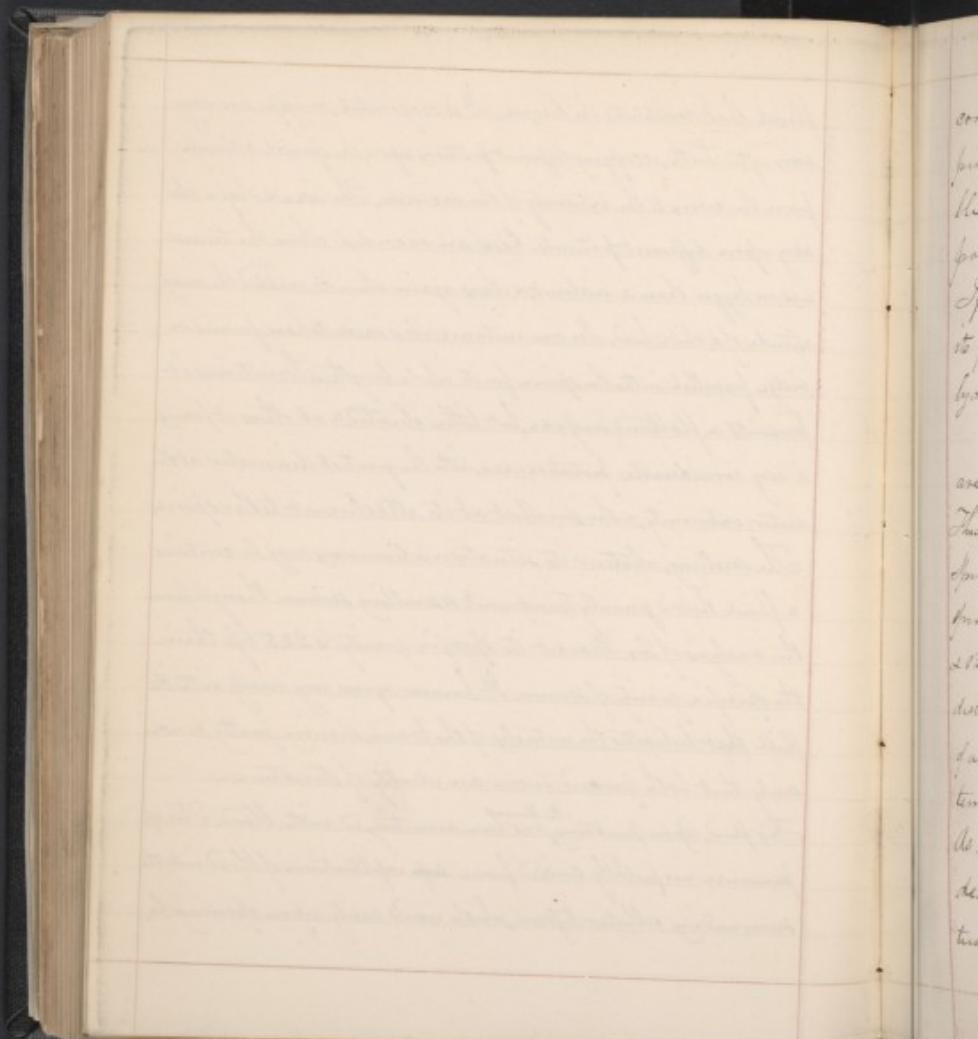
Convinced then of my inability to add anything to the subjects discussed in course by the several professors, & of the utility of theorizing aside from practical illustration, I have left the common routine, & chosen one of the opprobria (viz.) *Spina Bifida*. Two cases of its successful treatment have fallen under my observation, & the practice uses in some respects new & peculiar, the relation of them will not perhaps be unprofitable. It may first however be proper to give a general description of the disease as described by authors.

Spina Bifida (bis a finis) derives its name from the two-fold passage thus found in the spine, - the usual channel for the spinal marrow & the unnatural fissure, from which issues a tumour filled with a



fluid that constitutes the disease. It is congenital, or appears very soon after birth, occupying different positions upon the spinal column from the cervix to the extremity of the sacrum. The size & shape also vary upon different patients. Cases are recorded where the tumor was no bigger than a walnut, & others again when it reached the magnitude of a child's head. In one instance it is said to have formed a ridge parallel with the spine for its whole length. Sometimes it presents a flattened surface, but little elevated, & at others it forms a very considerable protuberance, with the greatest diameter at the anterior extremity, & the smallest at its attachment to the spine. The swelling, whatever its situation & dimensions may be contains a fluid that is generally transparent & resembling serum. Though from the analysis of Dr Marot its specific gravity is 22.5 less than the specific gravity of serum. It however agrees very nearly with the fluid that lubricates the ventricles of the brain, showing thereby conclusively that both proceed from an identity of structure.

This fluid, upon puncturing, ^{the tumor} has been seen tinged with blood. This appearance was probably derived from an infiltration of blood into the surrounding cellular tissue, which would easily upon opening be



come miscible with the more diluted & watery fluid, that occupies the cavity of the tumor. A fluctuation is always perceptible upon pressure, - the integuments are much distended, & at some points thinned so much as clearly to show what is contained within. If the enlargement is constant from birth, or from the time of its first appearance as usually is the case, it bursts spontaneously by soon proving fatal.

Paralysis of the lower extremities, involuntary discharge of urine are said to be occasionally the concomitants of this disease. This can readily be accounted for from the fact, that in all cases of Syphilis there is a deficiency of bone where the swelling protrudes - the osseous protuberances are entirely wanting or there is a partial formation. The tumor arises between the bones. The spinal marrow there is destitute of its usual protection, & is made to sustain the weight of an accumulating fluid, pressed strongly by the resistance of the external integuments, & the membranous sheath that lines the bone internally. As a consequence the action of the internal fasciculi of fibres is suspended - the nerves given off below the swelling, are cut out from all normal communication with the brain, & from the point where this

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great thoraxphere is blocked, animal life undergoes a complete cessation. But happily for the little patient, this combination is rarely found.

Some authors suppose this disease always attended by hydrocephaly & then consider it a compound droopy of the brain & spinal marrow. This was the opinion of Morgagni yet it does not seem to be well founded. The instance he cites by no means proves the position. A tumor followed a contusion on the head of a child of 4 years. In 4 weeks it was succeeded by an analogous tumor at the extremity of the sacrum. This last was punctured by Gougar & profuse made on the skinning of the head. Serum oozed out at the orifice, the tumor of the head subsided, & the child recovered. That this was a case of hydrocephalus & removal of effusion from without avoid inflammation within the cranium I do not deny; but it cannot be called a true case of fluid spine. Instead of the congenital deficiency we have a swelling at the age of 4 years from the natural opening at the extremity of the sacrum. Besides, from the length of time that intervened between the accident & the sacral projection it appears that the fluid found its way with difficulty into the vertebral

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canal by a pretermatured aperture caused by disease or mechanical action. The force of gravity would readily sink the fluid to the spinal opening & yet the spinal column remain unaffected by disease. That hydrocephalus internus should sometimes be found associated with bifid spines is by no means strange—the disease is so very common in its appearance. Yet we do not believe hydrocephalus a necessary progenitor or attendant on bifid spines—each may undoubtedly too exist independent of the other—for the symptoms of neither would be at all explained by the connection. Identity of structure & of function does not require continuity of disease action. Inflammation of any of the tarsi may exist in one part of the body & a similar tarsus in a remote or even adjacent part have all its function unimpaired. The arachnoid of the brain may suffer & its influence be unfelt by the same tarsi within the spine—but admitting the effect to be extended through the spinal column how will it account for the pretermatured deficiency? So far then ~~from~~ I now suppose that a necessary connection exists between bifid spine & hydrocephalus, that on the contrary I consider this union as one accidental. Otherwise, the case would be absolutely hopeless.

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The pathology of the disease is however yet imperfect. The Asiatic are
themselves attributed the deficiency of the vertebral to the tumor;—This as
I have said, suppose the original disease to be seated in the head &
the accumulation of fluid in the spine as a consequence—the
effusions finding an exit at the necked part. But probably
the proximate cause is to be found in the original malformation
of the spinal process. These, or rather the spinal column is
lined internally by the dura mater, the pia mater, & the tunica
arachnoidia. The arachnoid Bichat has demonstrated to be
essentially a strong membrane. It appears to be destitute of
blood vessels, & possess little sensibility unless exposed to the air or
other causes of inflammation. Bichat thought it a not=
work—an interlacing of exhalent & absorbent, whose office is
to pour out continually a watery, or secretion to lubricate the
adjoining membranes that protect the spinal canal, & to facilitate
their motion. When this exhalation has performed its function
it is immediately taken up by the absorbent, & thus a perfect
equilibrium is maintained between the two sets of vessels. But
whenever the continuity of the spinal column is at all interrup-

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ted, the pressure becomes unequal, & the equilibrium is destroyed. The exhalents still discharge their duty, while the tonus of the absorbents is diminished or suspended. The integuments & humorata are gradually lifted from this natural situation by the increasing unassisted liquid. Thus a tumor is formed as a mere consequence of local deficiency, & not the result of either of inflammation, or of general debility.

The progress of this disease is unfavorable, & till recently has been pronounced uniformly fatal. Indeed it has till recently, strange as it may seem attracted scarcely any attention. It has been considered utterly remediless like the whirlwind & tempest an unavoidable & merciless destroyer. Those happy beings, say they, which are the subjects of it, soon meet with a certain fatality if left to nature, & the interposition of art only leads to a similar, & more speedy issue. Hence the artless & poor scurvy has been frequently employed in vain - with the same results they have passed by on the other side; - no relief has been attempted for the little sufferers, - its permanent rest has been sought only in the grave. Belli Alesone

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W^m & Cooper, those living in surgery, have it is true ventured to propose & adopt new modes of treatment - but the result of their experiments is but little known among practitioners, & most men yet declare that the disease is instantly fatal.

Among the properties of cure are that of Fletcher by issuing, & that of Ruyech by blistering. Both act upon the same principle, & both in this case, however beneficial they may be in spinal disease of later life, seem rather calculated to irritate than produce any salutary effects. They cannot remedy the malformations, & thus a rootless power ^{alone} must be ineffectual.

Mr Benj^t Bell, in his work on Surgery, has suggested the property of encircling the pedicle of the tumor with a ligature to prevent its further extension & to effect its removal. After the separation of the cyst from its connections, he proposes the application of a soft compress & bandage to the part. Mr B. does not advocate the measure in very strong terms, - he even seems to think it questionable whether any useful results would follow. Yet he thinks almost any attempt justifiable that promises the least hope of success. No opportunity occurred to Dr B. to treat the disease in this stage, & it does not

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appears from later authorities, that any practitioner has venture
to adopt his plan. Notwithstanding, much credit is due to him for the
proposal - for the principle is undoubtedly correct & is the same
spiritually with that since acted on by Dr. Abernethy, & success-
fully by Dr. A. Cooper.

The plan of Mr. Abernethy is rational & deserves attention. He would
give support to the tumor, & at the same time promote absorption by
gentle pressure. Should this prove unsuccessful he would let out the
fluid by a needle or finely acting instrument, immediately closing
the orifice to prevent the action of extracting vessels, & he also recom-
mends in doses Alseep, & promoting the adhesive process by all pos-
sible means. A reaccumulation is to be avoided if practicable.
But in case of its occurrence the same means are to be successively
repeated *pro re nata* till a cure is accomplished.

I do not find that Mr. Abernethy put his scheme of puncturing
to the test in more than one instance. The fluid was evacua-
ted every few days for six weeks - when by accident the adhesive
plaster slipped from its place, additional irritation superven-
ed, ulceration & death. Although the termination of the case

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was unfavorably enough was done to show the accuracy of the principle.

Sir Astley Cooper pursued the design of Mr Abernethy, his efforts in two or three instances were crowned with success. The cases are detailed at length in the second Vol. of the London Medical Chirurgical Transactions. Samuel Cooper in his last edition of Surgery, 1828, says that these are the only cases of the cure of this disease on record. The first case presented a tumor the size of a walnut, returning uniformly upon the removal of pressure. A hollowed piece of gypsum was fitted to it - a bandage applied, & a cure effected. The tumor in the second case was the size of a billiard ball cut in half, & evidently too large to be compressed, without great danger. Accordingly it was punctured repeatedly, covered with a flannel roller, a comprep of pasticard, & over this another roller. The adhesions inflammation was invited & obtained - nothing remained of the tumor but the placid skin which formed the sack. In a 3rd case death followed the puncturing. In a 4th a cure was effected by a union of the two modes of treatment. Some of these cases had been seen by eminent surgeons as pronounced incurable.

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Showing clearly the situation in which the disease is generally held.
Much constitutional irritation was induced; but this is not
surprising when we take into view the tender age of the patient &
the delicacy of the parts affected. Sir A. Cooper views his first mode
of cure as attended by no risk, yet as requiring the constant use of
the tump in future life. His second mode although attended by
greater irritation, bears no apprehension of a recurrence of the
disease.

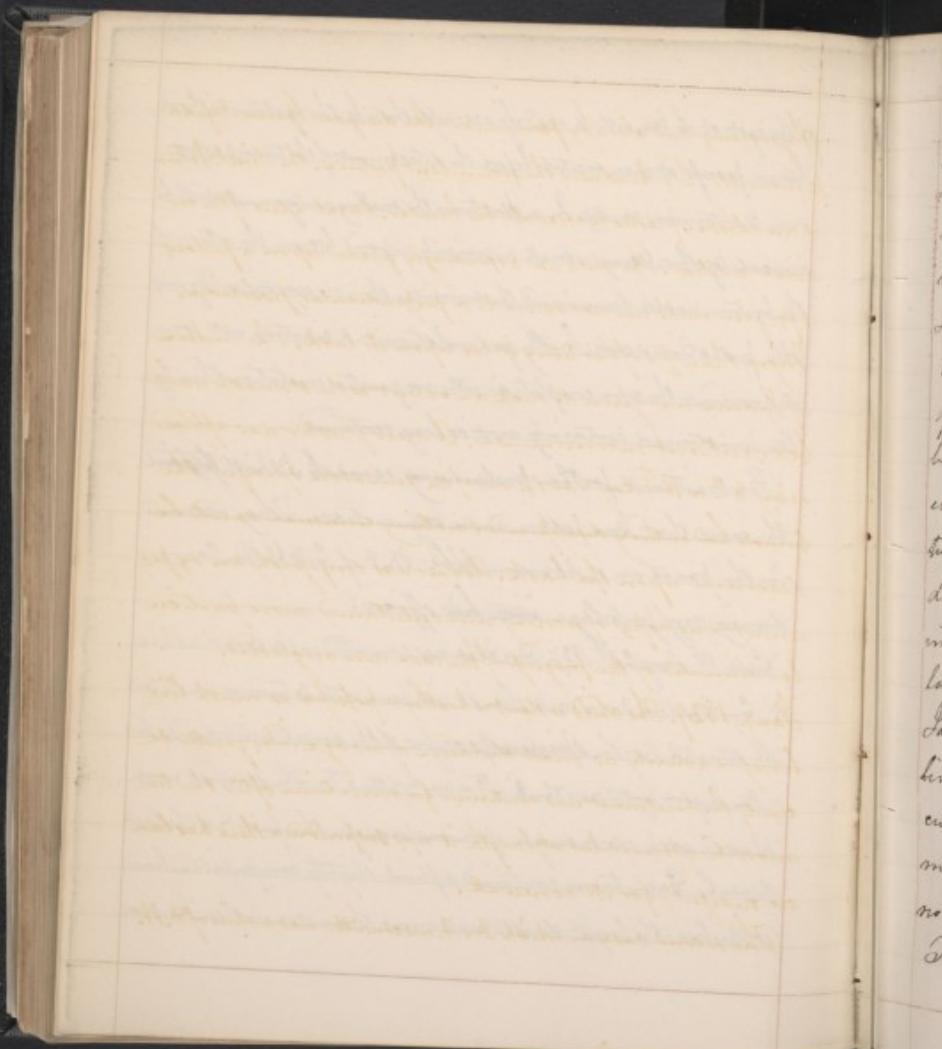
I have now gone through with all the trials worthy of notice
that have been made & the methods devised for the cure of this his
case. The plan of Mr Abernethy as treated by Sir A. Cooper gives
very satisfactory practical results, & is worthy of further trial.
But the proposal of Mr Bell we think should not be disregarded.
Many cases occur where the palliative cure cannot with safety
be attempted. It seems peculiarly adapted to those tumors that
are small or slightly elevated - with those which are large, & at
tached by a pedicle require the adhesive process. This in such
cases is much more readily initiated & accomplished by the scheme
of Mr Bell than by any other. An approximation of the sides

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of the eye at its base, will be readily accomplished by the ligation - and will
have force at once exerted before the detachment of the tumor, exposed
due to extraneous causes. In a short time the swelling instruments will be
removed together, leaving a small surface only exposed because the action of
the ligation would have incised the surrounding skin on every side. By int-
er-
the protection & care, healthy granulations & a cicatrix will soon
be formed & the cure completed with no greater irritation than by
the puncture, & certainly not so long continued.

But without further preliminary remarks I shall detail
the cases that have fallen under my notice. They occurred
in the practice of Alanson Abbe M.D. of Litchfield, Conn.
during my pupillage with his office.

Case 1st Aug 25th 1827. Dr Abbe was consulted in the case of a child
of 2-3 years 3 or 4 months old. It was born with 3 tumors on its back
all situated on the spinous process of the dorsal vertebra. The base
of the largest extended over the 3^d, 4th & part of the 5th. The smallest were
placed each over a single spinous process. The first at the last
dorsal. Each tumor contained a fluid slightly compressible, hard
at the base. The largest elevated not more than one inch. Several



Physician had already pronounced the disease Spina Bipida incurable. Dr A. advised the recumbent posture, the Tinct. Iodine & an adhesive plaster to cover all the lumbar, dorsal & two of the cervical vertebrae. The child was accordingly placed upon a pillow & for five weeks was not raised to a perpendicular position. More than $\frac{1}{2}$ of this time it lay upon its back. The Tincture of Iodine was given to such an extent as the stomach would bear without inconvenience. A new plaster was applied every 8th or 10th day, & at the end of the time above specified the tumors had entirely disappeared & nothing unusual could be discovered upon the back. As this was considered an experiment & no hopes of recovery were entertained more particular minutes of the progress of the case were neglected.

Jan'y 1829. The child is stout & healthy, & appears as much like living & activity as most children of his age. For greater security the treatment was continued for some time after the two mosses disappeared, but at length it was suspended, & there has been no necessity for its renewal.

The second case in which Dr A. was consulted, was a child of G. W.

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aged five weeks. It was born with a tumor whose base rested over the Thumbar vertebra. Several Physicians & some of them eminent had been previously consulted. All pronounced it Cervical spine in its worst form, advised no treatment, as death would instantly & speedily ensue. The tumor had rapidly increased, from birth & its dimension were now (May 5th 1829) at the base 138 inches in diameter - height $2\frac{1}{4}$ inches - diameter at the distance off from the base, $2\frac{1}{8}$ in. on a line parallel with the body. Its shape resembled a pear with the neck attached to the spine. It was soft, slightly compressible, having on its surface several irregular & ragged yielding spots, of a bluish cast, varying in size from $\frac{1}{8}$ to $\frac{5}{8}$ of an inch. Here the integument was extremely thin, much more so than on the remaining portion, which offered a very considerable resistance to pressure. But if the fingers were placed upon one of the yielding spots, & forced toward the base of the tumor, it would apparently penetrate in upon the vertebra, so that one Physician declared the absence, not merely of the ordinary process, but of the posterior portion of the body of the vertebra. At this time the tumor was adjudged to contain more than $3\frac{1}{2}$ of fluid.

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Very slight pressure put the child in absolute agony. No position could be borne except the prone. Dr. A. candidly expressed his opinion that the chances of recovery were small against the child, yet as speedy death otherwise seemed inevitable he thought it advisable to attempt a radical cure. He was the more confident from the success that had attended the preceding case, & from the fact that the child in all other respects appeared strong & healthy.

May 16th. The child was placed under Dr. F.'s care. With a view of lessening excitement & putting the system in the most favorable situation for the application of a ligature he prescribed 3. blue pills. qrs & j. every 4 hours till they respond faithfully. Then give the following. R. Ant. Tart. qrs & aqua ferment 3 v. M. cap. 31 g. 2 dr. h. & increase the dose, yet not so much as to create nausea. The recumbent posture strictly enjoined.

May 17th. At 11 o'clock A.M. applied a ligature to the base of the tumor. The circulation was stopped & the tumor soon grew cold. The child cried much pain & uneasiness, but its motions remained perfect. No convulsions. At 9 P.M. restful - slight spasms occasionally. Ordered R. Inst. Opium Camph 3 p. to be repeated

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10 A.M. to produce quiet und sleep. May 20th At 10 A.M. Circulation in some measure resumed the soft parts having yielded under the ligature - Applied a second - circulation entirely suspended; opened the tumor with a lancet, at first a trifling - then a bloody serum issued from it. At 6 P.M. the tumor commenced bleeding - 2/4 were lost. Applied another ligature, & at 10 another for greater security. During this period the child was kept under the full influence of anodynes, though he suffered considerably, yet the irritation was not sufficient to protract spasm. After the bleeding it was calm & rested quietly -

21st 9 A.M. Tumor lax & flabby - no trace of irritation.

9 P.M. much restlessness, apparently resulting from the state of the bowels. Rx Ol. Ricin. 3ij

22 10 A.M. Quiet & unattended by irritation. Three defecations from the oil, after which he moved well & appeared playful.

23 2 P.M. had a restful night, but is now quiet. 2 OJ: 2 ozs. rice well. Pulse ^{not} strong, but beats considerably. Tumor somewhat offensive. Therefore removed to within a 1/4 of an inch from the ligature. 24th Pulse more full, has had several slight tics since yesterday

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day & avoided wine profusely - has moved well & retain quantity. Continue the fine Soo. Comp. & add the following & fine fine Comp. 3/4v. Fine Iodine 7ij. Water. Caps. gtt. 8 three times a day & increase gradually
till you see as to offend the stomach.

25th. The dressings which had been carefully applied to exfoliate the air now became loose from the discharge of pus, perfectly healthy in its appearance. The integuments included within the ligature were separated, but the base of the tumor still adhered firmly by a portion of cellular substance & its own proper membrane to the body of the vertebra. Pulse good - moves well. Nothing particular occurred until the 28th when a diarrhoea commenced under which he became languid & the Pulse grew full. Base of the tumor still adherent, but healthy gone 3/4 of. Ricin. 29th. Bands moved by the air became regular. Pulse more full & strong. On removing the dressings the base of the tumor came away. Its union with the sheath of the medulla spinalis could distinctly seen coming out just at the inferior left lateral side of the primary process of the vertebra, & appeared in size the bigness of a crow-quill. The wound which is 6 inches more than inch in diameter appears healthy in every respect. 30th. Had taken cold

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pulse quickened & distended - not disposed to sleep. June 1st Recd. 3*ij.*
June 2nd Wound looks well - is half filled with healthy granulations
the spines protruding - no granulations upon them - general health
much improved. 5th Ulcer filling rapidly - Granulation of the spine
now profuse has a solidified appearance. 12th Ulcer filled with
granulations nearly cicatrized - general health continued good.
15th Patient entirely well - cicatrix perfectly formed. The child
gained in weight 13*lb* from the commencement of the treatment
till it was discharged as cured. The Codine was given regular
ly every day from the time it was ordered till 2 weeks after
it was discharged. The recumbent posture was strictly
maintained. Various dressings consisting of absorbent strips, sol
lvs. & soft compoys were applied during the progress of the case
according to circumstances.

January, 1829. The child has remained perfectly healthy &
is now uncommonly large & stony for one of its age. The
cicatrix presents a striated appearance - is very hard & ungathe
ring & gives a very firm support. At the age of eleven months
the child was able to walk without assistance & is now playful active.

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I need not say, the expectation & ardent hopes of some illit
erat members of the profession, freely & publicly expressed were hope
fully disappointed by this successful result.

Upon a review of this case it will be seen that the treatment dif
fers in some respects from any proposed by authors. The first
claims a proper case for the palliative cure of Sir A Cooper.
But instead of simple exposure with the hollowed plaster, it
occurred to D A that the recumbent posture, in a supine position
long continued, together with adhesive straps would in a case of
disease so extended keep up a more uniform exposure than
could be maintained by any other process. To aid these means of
cure he was induced to bring in the powerfully absorbent ac
tion of the Iodine, not only from the success which has attended
this remedy in the hands of Corinot, Manson, & later autho
rities, in cases of bronchitis, scrofula, fistula lachrymatis, white
swellings &c, but also from the good effects of its use in sev
eral analogous cases in his own practice. This iodine
strongly increases vascular action & excretion, & irritates an in
vitality of the living membrane of the abscess causing them to

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to take up whatever is presented with invigorated efficiency. In this case, combined with the accumbent posture, it seems to have been an all important measure towards the cure. The fluid was not merely poured inward upon the spinal column, but removed by the ~~carried~~^{carried} agency of these remedies, & as is often the case in the hernia of infants, a sufficient degree of invagination followed to effect a radical cure.

In the second case, the same measures, it is believed exerted no inconsiderable effect, not only as a part of the curative plan but as tending to prevent a recurrence. But the ^{more} remarkable feature in the treatment of this case was the application of the ligature. This seemed the only course that promised the least hope of success. The merit of the proposal as I have said rests with Mr. B. Bell, - but so far as I know this is the first case of its trial, & certainly no small share of credit is due to Dr. A. for ~~attempting~~ putting this scheme to the test of experiment. Says the editor of the Med. Chir. Rev. "There is one glory in deriving a name in creating." He that names what is forgotten or obsolete, applies it usefully, has nearly the merit of original invention, & discovery. (Chapm.)

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Under a judicious management then the application of the ligature in particular cases, especially where the tumor is attached by a pedicle, is superior to every other mode of treatment. By carefully removing all sources of irritation, & pursuing at the same time a well regulated course of general treatment in accordance with sound rules of practice, I have no doubt a speedy cure might often be effected, where now no consolation is offered to the parents or assistance to the child.

When called to cases of this sort I grant the surgeon is hitherto situated. The cases of cure are extremely small; - & few have the boldness to undertake what has been so rarely accomplished. He recollects that among people ignorant of the profession, the reputation of a surgeon may be unjustly ruined. If he abandons the child to its fate, as is too often done, penance may be avoided; yet if it die under treatment - the chances are manifold that it will - even should its doom be hastened scarcely a single hour. His character may receive irreparable injury. But at such a time timidity & softness are alike culpable; - the doubtful remedy is al-

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ways better than none, & it is never proper to shrink from the performance of duty. Life is desirable under almost any circumstances. The instinctive love of life gave birth & supposed medicine, & will give it perpetuity. The practitioner then should spare no efforts for its preservation till all hope is utterly extinguished. Viewing medicine as a beautiful system of inductive philosophy, let him proceed to the application of something, & not be daunted although some diseases are still regarded as hopeless. By practical deductions from general principles, & the application of new ^{remedies or} remedy of treatment they may possibly be overcome; - and it is a common merit to have saved a single individual from an untimely end.

